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Program Requirements Memoranda: Municipal Wastewater Treatment Works Construction Grants Program Supplement Number 9

(U.S.) Environmental Protection Agency, Washington, DC

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Office of Water
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Program Requirements Memoranda

Municipal Wastewater Treatment Works Construction Grants Program

MCD-02.9

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16. ABSTRACT

This Handbook contains the replacement pages and policy directive after the Manual of References (MCD-02) was published. This represents the ninth in a series of Program Requirements Memoranda.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF WATER PROGRAM OPERATIONS
WASHINGTON, D.C. 20460

NOTICE TO ALL HOLDERS OF THE EPA MUNICIPAL WASTEWATER TREATMENT WORKS CONSTRUCTION GRANTS PROGRAM MANUAL OF REFERENCES (MCD-02)

Because the material contained in the "Manual of References" is obsolete, further printing and distribution will cease. However, the program policy documents incorporated in that manual, and subsequently updated by the publication of supplemental issuances of new and revised Program Requirements Memoranda (PRMs), will continue to be made available to that segment of the public involved in various aspects of the Construction Grants Program. Hence, holders of the MCD-02 will continue to receive copies of Program Requirements Memoranda (MCD-02.00) as they are printed. So that PRM recipients are kept apprised of the completeness of their policy document library, a full index of PRMs issued will be included with each printing.

Municipal Wastewater Treatment Works
Construction Grants Program

PROGRAM REQUIREMENTS MEMORANDA

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

20 DEC 1979

Construction Grants
Program Requirements Memorandum
PRM 80-2

SUBJECT: Step 2 and Step 3 Architect/Engineer Level of Effort Study

FROM: Henry L. Longest II
Deputy Assistant Administrator
for Water Program Operations (WH-546)

TO: Regional Administrators
Attention: Water Division Directors

PURPOSE

The purpose of this memorandum is to initiate a multi-phase approach to establishing final Agency policy and guidance for evaluating the price for architect/engineer (A/E) services during Step 2 and Step 3 projects funded under the Construction Grants Program. In addition, it provides interim guidance for this evaluation which is to be used until the final policy and guidance are promulgated. For the purpose of this memorandum, the terms cost, price and profit have the meanings conveyed in 40 CFR 35.936 and 35.937.

The specific phases are as follows:

Phase 1. Pending development of final Agency policy and guidance discussed below, "Exhibit II" of the EPA Region VI publication entitled Engineering Costs and Fees for Municipal Wastewater Treatment Works, An Estimating Technique for Design of Treatment Plants, Publication No. EPA 906/9-78-003, may be utilized as an additional tool in analyzing the cost segment of A/E services to design treatment plants funded under the construction grants program. Profit should continue to be analyzed in accordance with specific policies or guidelines you currently use. These reviews of cost and profit should be initiated only when the grantee employed Brooks-bill type negotiations or otherwise did not consider price (the sum of cost and profit) as the prime criterion in selection of the engineer.

Phase 2. A computer model will be developed to provide estimates of the level of effort (work-hours) required to design treatment facilities (including sewers) of varying sizes and types. The model will also provide estimates of the level of A/E effort required during the Step 3 phase of a project.

Phase 3. Each Regional Office will accumulate level of effort and related information on recently completed Step 2 and Step 3 projects in its Region. This phase will be done simultaneously with Phase 2.

Phase 4. The information obtained from Phase 3 will be used to verify and "fine tune" the computer model being developed during Phase 2. It will also be used to develop a family of curves or charts relating work-hours, and perhaps price, for elements of Step 2 and Step 3 services to the size and type of treatment works. These curves or charts can be used separately or in addition to the computer model when it becomes available. These curves or charts will be prepared by an EPA task force which includes Headquarters and Regional Office personnel. The exact nature and format of the guidance documents has not yet been determined.

Phase 5. The curves or charts and computer model, when fully operational, will be used by Regional Office personnel, State Agency personnel and grantees in conjunction with appropriate cost, overhead and profit data, to determine if the price proposed by the engineer is reasonable.

DISCUSSION

Since publication of EPA regulations governing procurement of A/E services in December 1975 which prohibited A/E contracts based upon a percentage of construction cost or cost plus a percentage of cost, EPA Regional Offices have had a difficult time determining if the proposed price of A/E services was fair and reasonable. Most of the attention has focused on review of the profit segment of the engineers price and the State of California and several Regional Offices have developed policies and guidance for evaluating profit. This has led to numerous complaints about the lack of a uniform policy and the disparity in application of similar guidelines among the ten EPA Regions.

Based on data accumulated from firms and projects in its Region, Region VI developed the publication referenced above as a guide for reviewing the cost segment of A/E services to design treatment works. The cost data is probably not applicable to other Regions, but we believe that the estimate of work-hours required to design various type of treatment plants, which is shown in Exhibit II of that publication, may be a useful additional tool in analyzing the work effort required to design plants in other Regions. However, in utilizing the Region VI publication for this purpose, consideration must be given to regional differences in design due to climate and other factors, established State or local practice as to the number of construction contracts required, level of detail shown on plans, an individual firm's approach to design and changes in Agency Regulations since the Region VI data was collected. By applying an engineer's salary scale to the work-hour estimate, as modified by the previously cited considerations, adding other direct expenses and applying the appropriate overhead rate, a reasonable estimate of the cost segment of A/E services for design can be determined.

Our objective is to expand the Region VI study to incorporate data from all other Regions. To accomplish this, we are requesting that members of your construction grants staff extract required information from your files and visit A/E firms in your Region to collect level of effort and other data related to activities such as preparation of plans and specifications, preparation of UC/ICR systems, preparation of plans of operation, including O&M Manuals, resident engineering services during construction and other Step 2 and Step 3 engineering services. The visits may be combined with your other activities such as review of financial systems and records or consultation on other matters. To assist in this effort, Mr. Le Young of Region VI and a cost/price analyst will spend a week to ten days with your staff to explain the methodology and procedures to be used in collecting the required data and may accompany them on some of the field visits.

The cooperation of the consulting engineers is essential to the success of this effort. Therefore, it should be explained at the outset, that as a result of this study, more emphasis will be placed on the fairness and reasonableness of the price of A/E services and less on level of profit. Also, experience in Region VI showed that it is helpful to seek the cooperation and assistance of the professional societies such as the American Consulting Engineers Council, American Society of Civil Engineers, National Society of Professional Engineers or similar professional organizations. Representatives of these organizations at the national level are acting as advisors to the EPA task force.

The Corps of Engineers, in cooperation with EPA, has developed a computer model, known as CAPDET, which, when given certain basic information, provides preliminary designs and construction cost estimates for treatment facilities of various types. This system is to be expanded to provide an estimate of the level of A/E effort (work-hours) required to design and construct treatment facilities. It has been decided to estimate "level of effort" rather than cost so that the model will be applicable nationwide and will not be quickly outdated by inflation. However, the model will be capable of translating level of effort information into dollar values when the appropriate cost information (labor rates, indirect costs, other direct costs) and profit levels are entered into the computer system.

The computer model will be developed by consultants under contract to the Corps of Engineers operating under an Interagency Agreement with EPA. The initial contract for this work is expected to be executed in the near future and the development of the computer model will be done concurrently with the Regional data gathering.

IMPLEMENTATION

When the grantee employed Brooks-bill type negotiations, or otherwise did not consider price (the sum of cost and profit) as the prime consideration in selection of the engineer, Exhibit II of the Region VI publication may be used as an additional tool in determining whether the cost segment of A/E services is reasonable. Profit should continue to be analyzed in accordance

with specific policies or guidelines you currently use until such time as a decision is made as to the advisability of establishing National Guidelines. Further guidance for review of profits will be provided in the near future.

It is requested that an appropriate person be designated to coordinate your participation in this study. Please advise James R. Murphy, Chief Eastern Construction Branch at (FTS) 426-8945 as to the name and telephone number of the person so designated. Mr. Murphy can also answer any questions you may have regarding this PRM.

In the near future, the appropriate Area Program Manager will contact your designee to arrange for Mr. Young's visit to your Region.

The methodology, work plan and schedule, and appropriate guidance for the conduct of this study are being developed by Headquarters and will be mailed to you as soon as the material is completed. Should you need additional copies of any document referenced in this memorandum, they are available from the Municipal Construction Division, EPA Headquarters.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

26 NOV 197-

OFFICE OF WATER AND
HAZARDOUS MATERIALS

Program Requirements Memorandum
PRM No. 80-1

SUBJECT: Discount Rate

FROM: for Henry L. Longest II
Deputy Assistant Administrator
for Water Program Operations (WH-546)

TO: Water Division Directors
Regions I - X

Attached is a copy of the notice published by the Water Resources Council of the new discount rate of 7 1/8 percent. The new rate was effective as of October 1, 1979. Cost-effectiveness analyses in new facility planning starts are to be based upon the rate of 7 1/8 percent.

We have arranged to distribute the attached information to consulting engineers through the newsletter of the Consulting Engineers Council. Please distribute copies of this information to the States for use in their programs.

Attachment

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5.5. Delivery of securities in registered form will be made after the requested form of registration has been validated, the registered interest account has been established, and the the securities have been inscribed.

6. General Provisions

6.1. As fiscal agents of the United States, Federal Reserve Banks are authorized and requested to receive tenders, to make allotments as directed by the Secretary of the Treasury, to issue such notices as may be necessary, to receive payment for and make delivery of securities on full-paid allotments, and to issue interim certificates pending delivery of the definitive securities.

6.2. The Secretary of the Treasury may at any time issue supplemental or amendatory rules and regulations governing the offering. Public announcement of such change will be promptly provided.

Supplementary Statement

The annoucement set forth above does not meet the Department's criteria for significant regulations and, accordingly, may be published without compliance with the Departmental procedures applicable to such regulation.

Paul H. Taylor,

Fiscal Assistant Secretary.

[FR Doc. 79-33577 Filed 10-25-79; 4:02 pm]

BILLING CODE 4810-40-M

WATER RESOURCES COUNCIL

Principles and Standards for Planning Water and Related Land Resources, Change in Discount Rate

Notice is hereby given that the interest rate to be used by Federal agencies in the formulation and evaluation of plans for water and related land resources in 7⅛ percent for the period October 1, 1979, through and including September 30, 1980.

The rate has been computed in accordance with Chapter IV, D., "The Discount Rate" in the "Standards for Planning Water and Related Land Resources" of the Water Resources Council, as amended (39 FR 29242), and is to be used by all Federal agencies in plan formulation and evaluation of water and related land resources projects for the purpose of discounting future benefits and computing costs, or otherwise converting benefits and costs to a common time basis.

The Department of the Treasury on October 18, 1979, informed the Water Resources Council pursuant to Chapter IV, D., (b) that the interest rate would be 8¼ percent based upon the formula set forth in Chapter IV, D., (a): "* * * the average yield during the preceding Fiscal Year on interest-bearing marketable securities of the United States which, at the time the computation is made, have terms of 15 years or more remaining to maturity * * *." However, Chapter IV, D., (a) further provides "* * * that in no event shall the rate be raised or lowered more than one-quarter of one percent for any year." Since the rate in Fiscal Year 1979 was 6⅞ percent (42 FR 58232), the rate for Fiscal Year 1980 is 7⅛ percent.

Dated: October 24, 1979.

Gerald D. Seinwill,

Acting Director.

[FR Doc. 79-33200 Filed 10-25-79; 8:45 am]

BILLING CODE 8410-01-M

INTERSTATE COMMERCE COMMISSION

Directly Related Motor Carrier Applications

AGENCY: Interstate Commerce Commission.

ACTION: Notice for proper filing of motor carrier applications directly related to finance applications.

SUMMARY: Persons filing motor carrier applications [for instance, related gateway elimination or conversion applications under 49 U.S.C. 10922 or related securities applications under 49 U.S.C. 11301] which are directly related to motor finance applications filed under 49 U.S.C. 1343–11344 are instructed to write in *bold* print at the top of page one *of the directly related application* the words: "Directly Related." Also, persons are instructed that one copy of all such directly related motor applications must be mailed to the Supervisor of the Finance Support Unit, Room 5414, Interstate Commerce Commission, Washington, D.C. This will improve the ability of the Commission to consolidate and process together all motor applications which are directly related to finance transactions.

DATES: These instructions will apply to all directly related motor applications filed with the Commission on and after November 1, 1979.

FOR FURTHER INFORMATION CONTACT: Michael Erenberg, 202–275–7245; Frank Beane; 202–275–7643 or 7615.

SUPPLEMENTARY INFORMATION: On July 16, 1979, the Commission's final decision in Ex Parte No. 55 (Sub-No. 35), *Summary Grant Procedures (Finance).* 44 FR 41203–41205 (1979), was issued. That rulemaking for quicker grant applications, as applications whi to these finance instructions we these directly rel *(whether they ar finance applicat therefrom)* are ir coordination and Too often, a dire application (for conversion, secu applicants or Co in delays in the p applications whi and decided to ge

The instruction applicants filing applications (for OR-9 for convers elimination or securities issuan bold print at the application tha *"Directly Related* application unde purchase, control operating rights instructions also of each such dir application be of the Finance Interstate Comm Street and Con Washington, D

Dated: October 2

By the Commis Director, Office of

Agatha L. Mergenov

Secretary.

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FSA No. 43760, I intermodal rates o commodities in co carriers' terminals Pacific Coast to po by way of Atlantic points, in its Tariff No. 29. Rates beca 7, 1979. Grounds fo competition.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

SEP 5 1979

Construction Grants
Program Requirements Memorandum
PRM No. 79-11
SAM 38

OFFICE OF WATER AND
HAZARDOUS MATERIALS

Subject: Funding of Waste Load Allocations
and Water Quality Analyses for POTW Decisions

From: Swep T. Davis, Deputy Assistant Administrator
for Water Planning & Standards

Henry L. Longest II, Acting Deputy Assistant Administrator
for Water Program Operations

TO: Regional Administrators
ATTN: Regional Water Division Directors

Purpose

This memorandum establishes policy and procedures for the funding of waste load allocations and water quality analyses required for publicly-owned treatment works (POTWs) decisions.

Background

EPA, recognizing the costs and energy requirements of publicly-owned treatment works (POTWs) providing treatment greater than secondary (AST/AWT), has taken several steps to insure that such facilities are only Federally funded when based upon technically adequate effluent limitations. In June 1978 a joint OWPS/OWPO guidance memorandum was issued which contained a checklist to be completed before a project providing AST/AWT could receive construction grant funding. On November 2, 1978, SAM 37 was issued by OWPS which established policy and procedures for the use of Section 208 funds to review and revise waste load allocations for POTWs subject to permit limitations requiring AST/AWT. On March 9, 1979, PRM 79-7 was issued by OWPO which established policy and procedures for the review and funding of proposed AST/AWT projects. Reduced Section 106 and 208 FY 80 appropriations coupled with increasing demands on Section 106 funds to support the issuance of second round NPDES permits and expanded monitoring programs may result in some states being unable to provide adequate funding for the timely review and revision of waste load allocations. It is therefore necessary to provide additional

policy and procedures for FY'80 on the use of Section 201 and 205(g) funding to augment Section 106 funds to support these tasks.

Policy

Nothing in this memorandum is to affect the responsibility and right established by Sections 303 and 510 of the Clean Water Act for each State to develop water quality standards and waste load allocations. The State water quality management program will continue to exercise overall management responsibility for assuring that water quality analyses and waste load allocations are conducted in a satisfactory manner. The primary sources of funding for these activities are program grants and State funds. The amount of Section 106 and State funds currently expended for POTW-related waste load allocations should not be reduced because Section 201 and 205(g) funds may be used, on a case-by-case basis and subject to requirements in this memorandum, to augment State and Section 106 funds to provide for the development of POTW-related waste load allocations and supporting water quality analyses. Except where EPA and the State have determined that existing limitations should be revised, Section 201 and 205(g) funds may not be used to review effluent limitations or to develop alternative effluent limitations; e.g., costs associated with the development of data in support of Section 301(h) permit modification request are solely the responsibility of the requesting municipality and are not grant eligible. Where Section 201 or 205(g) funds are used, the areal extent of waste load allocation and water quality data collection activities must relate directly to needed waste load allocations for projects that are on the State 5-year construction grant priority list.

The priority for use of Section 201 and 205(g) funds to conduct waste load allocations and water quality analyses is:

1. POTWs which have been determined by EPA and the State, as a result of a PRM 79-7 review, to require a revised waste load allocation.

2. POTWs on the State 5-year construction grant priority list for which the State and Regional Administrator have determined, through the State/EPA agreement process, that existing waste load allocations are probably insufficient to support AST/AWT requirements.

SAM 37 continues to apply to the use of FY'78 and 79 Section 208 funds for waste load allocations and water quality analyses. FY'80 Section 208 funds may not be used to initiate POTW-related waste load allocations.

Procedures

1. FY 80 State/EPA Agreement: If Section 201 or 205(g) funds are to be used for waste load allocations, the FY 80 State/EPA Agreement (SEA) must contain or provide for the development of a detailed State review of the 5year construction grant priority list. Specific provision for the review may be contained in the SEA itself or in the Section 106 program plan or the 205(g) delegation agreement. Wherever a POTW has effluent limitations potentially requiring AST/AWT and Section 201 and 205(g) funds may be used, the SEA, Section 106 program plan or 205(g) delegation agreement shall provide for:

- an informal review of applicable water quality standards to determine whether they contain unsupported requirements or criteria; e.g., blanket discharge prohibitions or criteria substantially more stringent than contained in Quality Criteria for Water or any subsequent criteria documents published by EPA.
- the review of existing waste load allocations, if any, to determine whether they are technically valid and sufficient to support AST/AWT effluent limitations.
- the review of any other water-quality based permit limitations not derived from water quality standards or waste load allocations to determine whether they are valid.

Wherever the State and EPA determine that an effluent limitation is not valid or supportable, the State shall provide a program to rectify the inadequacy. One component of this program shall be a list of projects for which it is necessary to substantiate inadequate AST/AWT effluent limitations. This list should subdivide these projects into those requiring new or revised waste load allocations and those requiring other work. Projects requiring new or revised waste load allocations should be subdivided into the two priority classes described above. Until this listing is complete, Section 201 and 205(g) funds may not be used to fund waste load allocations.

For all cases where the State has determined that effluent limitations are unsupported for reasons unrelated to waste load allocations, the priority of resolution shall be determined by the State and Regional Administrator.

2. Funding: The SEA shall allocate costs to produce valid effluent limitations as follows:

- Section 106 funds may be used in any situation.
- where tasks relate to the basin-wide revision of waste load allocations, or to waste load allocations/water quality analyses not directly related to a POTW on the SEA needs list, only Section 106 or State funds may be used.

Section 201 and 205(g) funds may be used to augment Section 106 funds for priority one projects upon issuance of this memorandum. Section 201 and 205(g) funds may be used to augment Section 106 funds for priority two projects upon EPA approval of the State waste load allocation program.

3. Headquarters Assistance: PRM 79-7 provides for OWPO and OWPS review of the adequacy of effluent limitations and facility planning for certain proposed AWT facilities. Upon request, OWPS will provide technical assistance and advice on the review of existing water quality standards and waste load allocations, the development of work programs, and on draft work products.

4. Relationships: The use of Section 201 and 205(g) funds for waste load allocations and the involvement of 201 grantees is new so that additional guidance is necessary:

- responsibility for the validity of waste load allocations lies with each State in accordance with Section 303(d)(1)(C) and 303(e)(3) of the Clean Water Act.
- accountability for Section 201 funds used for waste load allocations and supporting water quality analyses will rest with the Section 201 grantee even though the grantee may execute a contract or intergovernmental agreement with the State or the State and an areawide 208 agency to perform the work.
- in order to prevent a conflict of interest, it is recommended that waste load allocations and supporting water quality analyses not be conducted directly by the Section 201 grantee. It is recommended that the Section 201 grantee instead execute a contract or intergovernmental agreement with either the State or the State and an areawide 208 agency, which may subcontract the work, if necessary.
- wherever Section 201 funds are to be used for waste load allocations/ and water quality analyses, the scope and schedule of work and the consultant contract shall be approved by the State and EPA. The terms of this approval shall be made a condition of the grant and shall be contained in a memorandum of understanding entered into by EPA, the State, the 201 grantee, and, when appropriate, the areawide 208 agency. EPA and the State should be intimately involved in all phases of the work as discussed in the attached management guidance.
- the conduct of joint waste load allocations is encouraged.

Some previous waste load allocations funded by EPA ultimately failed to be valid because of inadequate data, inexperienced personnel and improper use of mathematical models. Consultant contracts should include specific performance standards and a quality assurance program covering, where

applicable, model calibration and verification, sampling and analytical methodologies, statistical adequacy of data, and personnel requirements (see the attached management and technical guidance).

5. Municipal Enforcement Strategy: The "Final National Municipal Policy and Strategy for Construction Grants, NPDES Permits, and Enforcement Under the Clean Water Act" (August 1979) provides that for projects undergoing an AWT review, NPDES permits should not generally be reissued until this review is completed. Procedures for modifying or reissuing permits for these projects are detailed in this document.

Attachments:

Management Guidance
Technical Guidance

Management Guidance for Funding of WLA Studies

Background

In order to ensure that grant funds for WLAs are used in an effective and efficient manner, OWPS will be working with the Regions to ensure that all Regions using 106, 201, 205(g) or 208 funds for WLAs have atleast a minimal technical capability in the WLA program area. In addition, there should be a strong State program in this area or a committment by the Region to guide and take responsibility for WLA work done in States lacking a strong WLA program. This part of the guidance describes what factors Headquarters will consider in evaluating the Region's technical capability in the WLA area. It also addresses what factors the Regions should use in evaluating State WLA programs.

I. Regional Management Guidance

OWPS is presently conducting a study of the AWT/WLA program in each Region. Each regional contact has received a copy of the draft report on their Region for their comment and review. Our aim is to work with any Region needing assistance to ensure that all Regions develop the necessary minimal technical capability by FY 80.

Based upon our work thus far, the following factors appear to be critical:

(a) Regional Staffing Levels

The Region should have an identifiable staff for guiding and reviewing:

- Work-plans for development of WLAs
- Contract Work Statement for WLAs
- Interim output of WLA Studies
- Final WLA
- State WLA effort

(b) Regional Staff Qualifications

Staff responsible for overseeing WLA work must include individuals trained and experienced in all aspects of the development of WQ based effluent limits, e.g., planning and conduct of WQ intensive surveys, mathematical modeling of receiving waters including calibration/verification, etc.

II. State Management Controls for 201 and 205(g) Funded WLA Studies

1.

(a) The State must have an identifiable staff which is qualified and capable of, developing if necessary, or guiding and reviewing:

- Work Plans for development of WLAs
- Contract Work Statement for WLAs
- Interim outputs of the WLA Study
- Final WLA

(b) State Staff Qualifications

Staff responsible for overseeing or developing WLA studies must include at least one individual trained and experienced in all aspects of the development of WQ based effluent limitations, e.g., planning and conduct of WQ intensive surveys, mathematical modeling of receiving waters including calibration/verification, etc.

2. EPA approved State Procedures

State technical procedures and policies, (including math models used, safety margins, data requirements, modeling assumptions, etc.), for WLA development must be documented by the State and reviewed and approved by the Region.

3. EPA approved WQ Standards

EPA approved WQ standards must be in place prior to commencement of the study.

4. Procedures for approval to initiate a WLA Studies

The State and Region must guide the development of WLA, and review and approve the following prior to initiation of the study:

(a) Remedies to previous deficiencies

Deficiencies that caused the original WLA to be rejected must be identified and solutions or remedies proposed.

(b) Selection of contractor/consultant to perform the WLA

This selection must be jointly made by the grantee, State and Region, and should be based largely on the contractor's previous performance in conducting such studies.

5. Work Plan for development of the WLA

A detailed work-plan must be developed by the grantee (or contractor). The work-plan must include details on all tasks necessary in the development of the WLA. The major elements of the study will be (1) Data Needs and Collection (2) Water Quality Analyses/modeling and (3) Allocation of pollutant loads and determination of effluent limitations on the basis of the WQ analysis. Tasks for each element must be described in detail, including description of work, cost, output of the task and projected date of completion.

(a) Approval of Work-Plan

The Work-plan must be reviewed and approved by the State and EPA prior to conduct of the study. The plan will serve as the guiding document for development of the WLA.

(6) State-EPA tracking of the Study

The Region and State must closely scrutinize every major output of the study as it proceeds. A review mechanism must be developed, which will provide for timely reviews with recommendations for any mid course changes necessary.

The study should proceed in stages or phases that are designed to produce concrete reviewable outputs at the end of each phase. EPA and the State must review each output prior to initiation of the next phase. Errors or shortcomings must be flagged immediately, and steps taken to correct the situation before the study resumes.

Preliminary Technical Guidance for WLA Studies

Objectives

This package provides technical guidance on development of WLA's. The guidance establishes the basis for a credible procedure for WLA computations. Experience concerning what to emphasize has come from EPA water quality reviews of POTW projects requiring treatment more stringent than secondary. EPA's concern is that all future WLA's be sound, reasonable, and technically defensible.

This preliminary guidance will be refined and improved. Comments are encouraged.*

It is EPA policy (PRM 79-7) that: "That Agency will conduct a rigorous review of projects designed for treatment more stringent than secondary"; and, with respect to WLA, that: "The waste load allocations or other analyses resulting in the effluent limitations, along with the assumptions on which the analysis is based, are scientifically supported by intensive water quality surveys or appropriate field investigations conducted on the water bodies in question, and calibrated and verified models or other technically sound analyses".

This guidance seeks to aid these policies and presents information on:

1. the typical level of analysis expected for most WLA studies to satisfy EPA review. Exceptions, of course, are possible and should be justified. Examples are simple cases needing only "desk top" computations or complex cases needing very specialized mathematical models.

2. a "norm" for a scientifically defensible WLA procedures. A justification process that follows the norm would not be expected to cause controversy in the EPA review. Departures from the norm should be discussed and rational explanations presented.

3. the list of representations and presentations that a well documented WLA should have according to current EPA review procedures.

4. a checklist of problem areas that have stalled EPA WLA reviews, or which are expected to cause difficulties in scoping future WLA studies; these areas will be further clarified as this guidance is refined.

*Comments should be directed to Dr. Tim Stuart (FTS-426-7766), Chief Monitoring Branch, Monitoring & Data Support Division (WH-553)

EPA Expectations

The typical situations are described in this section. Unusual situations, as they occur, will be judged as departures from the following normal factors and criteria. The logical core of typical WLA analyses and water quality concerns can be summarized with three main points.

1. For most projects, EPA anticipates that the WLA will be based on dissolved oxygen and/or nutrient (N,P) water quality criteria. Of course, other water quality criteria will be considered when relevant to the particular project being reviewed. (A significant additional criterion is ammonia, in relation to fish toxicity). Within this context:

   a. If D.O.-related WLA's are proposed (BOD, NH3/TKN, reaeration), specify the D.O. criterion in the WQS for the surface waters in question. Are there minimum and average components in the D.O. criterion?

   b. If nutrient (N or P) WLA's are proposed, are there numerical ambient criteria for these nutrients, if yes, specify. If not, are there other provisions in the WQS that address nutrients, such as narrative criteria that water should be free from aquatic nuisances, algal counts, chlorophyll criteria? Explain.

   c. If WLA's are proposed for parameters other than those related to D.O. or eutrophication, are there provisions in the WQS for their control?

2. EPA will use the following criteria when evaluating WLA's related to dissolved oxygen (BOD, TKN, reaeration.)

   a. A steady-state, Streeter-Phelps-type analysis or model (considering both carbonaceous and nitrogenous wastes) at the critical flow condition is acceptable, unless existing water quality data or the hydraulic setting clearly indicates significant time and flow varying D.O. problems.

   b. The predictive capabilities of the analysis/model must be adequately demonstrated. This can be accomplished through calibration and verification using two independent sets of water quality data for the receiving water in question. If calibration and verification are not done, the WLA documentation must explicitly describe how the predictive accuracy of the analysis was established.

c. Weather-related nonpoint sources (NPS) loadings do not have to be considered directly in low-flow situations; however, the analyses should make reasonable allowances for any leachates, benthic oxygen demands, and background D.O., BOD, and ammonia.

d. An analysis based on historical data should have been made to determine the critical conditions for streamflow and temperature if not prescribed by State WQS.

e. If the critical flow situation is not a low flow, then it must be indicated how NPS loadings were considered; this is particularly true for combined-sewer situations.

3. EPA will use the following criteria when evaluating WLA's for nutrients (P, N):

a. The analysis must demonstrate why a nutrient/eutrophication problem is anticipated based on existing ambient water quality data and field observation.

b. Sources and loadings of nutrients from both point sources and NPS must be evaluated, including estimates of the relative contributions from each. Annual mass balances should be presented.

c. The analysis must indicate how the limiting nutrient was identified and evaluated for the water body in question.

d. The analysis must indicate how the decision criteria for maximum nutrient loadings were established for the water body in question.

e. If NPS loadings will be the major source of nutrients after the proposed plant is operating, the justification must describe what BMP's were considered and selected or rejected. How and when will the BMP's be implemented?

Scientifically Accepted Procedures

The objective of this section is to define an approach to the methodology of wasteload allocation. The approach anticipates linkages to coordinate complex analysis techniques. Analysis and the related policy problems are complicated by a large number of interacting factors. Among these factors are included: point source (PS) wasteloads, nonpoint source (NPS) loads contained in land washoff, possible combined sewer overflows (CSO) and interactions of meteorologic conditions that effect pollutional stress including streamflow, rainfall and water temperature.

Within this framework there exist mathematical computer models with which the environmental impacts to water quality can be studied. These models range from simple to complex. Models are tools for estimation of water quality impacts for constant or steady pollutant loads. The intent of EPA is that when one uses complex models to handle a complex situation, the margin of safety for load allocation can be reduced.

Water Quality Standards

The WLA approach assumes that stream standards are given, and are consistent with the designated use classification of the receiving stream. In this regard, it should be noted that all waters, including intermittent streams, regulated by State water quality standards must be classified and meet the criteria applicable to that classification. These standards may provide for time-limited variances for specific dischargers, as long as existing uses are protected. In general, a specific variance proceeding is preferred to a general downgrading.

Where intermittent streams do not currently meet designated uses and cannot attain these designated uses due to 1) natural background features; 2) irretrievable man-induced conditions; or 3) widespread adverse economic and social impact (See 40 CFR 35.1550 (c)(2)), a downgrading is warranted. However, no downgrading may impair or preclude existing water uses. EPA is developing guidance on downgrading of use classification based on widespread adverse economic and social impact (item #3 above).

Wholesale downgradings are not permitted, and would violate EPA regulations 40 CFR 35.1550.* Also, intermittent streams often serve an important role in stream ecology as spawning and feeding grounds. Therefore, to determine whether a downgrading from the "fishable" classification is warranted, a site-specified investigation of the particular intermittent stream segment by qualified engineers or scientists is required. For downgrading to be approved based on natural background or irretrievable man-induced conditions, this field survey would have to show that the site does not support fish survival or propagation, and even with discharges at normal levels meeting existing water quality standards would not support a fishable use.

The link between wasteload allocations and stream standards is a mathematical model to predict water quality as a function of waste discharges. Such models exist and are integral parts of the methodology. For such a method, the wasteloads are one of a set of required input data. Other members of the set include: geometric definition, upstream and tributary streamflows, water quality of streamflows, quantification of forces other than gravity that influence the water movement including tides and radiation, and parameters that define the transformations of the water quality.

The WLA methodology has the following elements, any of which may be greatly simplified given technical justification:

1. Based on a preliminary review of the discharge site and the expected impact of the pollution load, selection of a model is required. This model should be calibrated and verified for use in the WLA. For DO, the normal model will be a Streeter-Phelps type (Considering both carbonaceous and nitrogenous waste) unless circumstances dictate otherwise. For nutrients, a rational and defensible approach should be defined; a typical acceptable method for a lake is an annual mass balance linked to a Vollenweider assessment.

*Refer to OGC #58 dated March 29, 1977.

2. A determination of the magnitudes of the wasteloads as a function of location and future population and land use.

   a. The point source loads are subjected to various treatment levels in accordance with current policy and may be transported to various points according to different local and regional collection schemes. The array of these possibilities becomes the alternative set for allocation analysis.

   b. The NPS loads may or may not be a factor in the final WLA. At the beginning of a WLA analysis, NPS loads must be evaluated to determine if they should be directly considered in situations involving nutrients and eutrophication.

3. A determination of what constitutes the "design event" or critical conditions is required. The design event, expressed in terms of such variables as streamflow, temperature and waste discharges, describes a specific condition under which water quality standards must be met. One allocates waste loads for the design event but should, if appropriate, make allowances for seasonal variability. This design event takes into consideration discharger exemptions from portions of WQS, when natural background conditions, such as flow, naturally high pollutant concentrations, etc. preclude attainment of some existing or designated uses. However, all WQS required to support uses that exist under low flow conditions must be met. Furthermore, effluent must not cause a nuisance, due to objectionable deposits, floating debris, or objectionable color, odor, taste, or contain toxic pollutants in toxic concentrations.

   For point source loadings, low summertime flows are usually used. For nonpoint source loadings no usual condition or standard of practice exists. In some cases, the problem of defining the "design event" can be avoided by using continuous simulations with a mathematical model. A continuous simulation continuously translates a time series of hydrologic, meteorologic and wasteload conditions into a continuous representation of water quality. The results of continuous simulations can be inspected and the failure frequency can be evaluated more directly.

4. The acquisition of data pertaining to how the waters respond to wastes is necessary. Either existing data may be assembled, or a field program is needed. Such field programs should be of short, intense duration and should measure waste inputs and water quality responses simultaneously for at least two separate situations (high and low flows or warm and cold water or two other events for which water quality responses are different for the same receiving waters).

5. EPA recognizes the concept of tranferability of water quality data from one discharge site to another similar discharge site. However, it should be emphasized that transferability, although an acceptable concept, is not applicable in every situation and calls for considerable judgment on the part of the water quality analyst to determine whether a situation is amenable to modeling based on transferred water quality data. EPA is currently developing detailed guidance on the use of transferred water quality data, and the criteria and constraints within which such transference may be attempted.

6. The fitting of the forecasting method (mathematical model) to the data is necessary. A two data set approach is the standard practice:

   a. The first data set is used to adjust the transformation parameters of the model until observed water quality agrees with forecasted water quality. This process is called calibration.

   b. The second data set is used in the calibrated model to independently check the forecast. If the model can forecast the second data set the model is verified.

7. The forecasting of water quality for the "design event" using alternative WLA's is conducted in order to prescribe the WLA. Two strategies are possible in the implementation of this element, each of which is oriented to determining whether or not carrying capacity is sufficient to prevent violation of water quality standards.*

   a. The alternative projected loadings can be individually analyzed and the water quality forecast. Degree of treatment levels are gradually increased until the water quality standards are satisfied.

   b. It is possible to work directly with the carrying capacity. The maximum amount of wasteload that can be introduced into the water and still satisfy the water quality standards is determined. This amount is allocated to the dischargers.

8. An analysis of the impacts of errors, or changes in parameters, forecasts, and modeling assumptions upon the wasteload allocation is desirable. This sensitivity analysis is useful for the WLA review process.

*Note that Section 303(d) of the Clean Water Act and EPA regulations require that an margin of safety be included in the WLA. Also, note that nondegradation requirements apply for the National Resources Water listed on page 6 of PRM-79-7.

The methodology of wasteload allocation studies is complex and the normal mathematical model is a Streeter-Phelps type that handles carbonaceous and nitrogenous components. Other methods exist and all methods, from simple hand calculations to computer models, require a detailed data base describing the quality and the hydrology of the receiving waters. Water quality data should, if possible, quantify and qualify the following physical, chemical, and biological parameters: BOD, dissolved oxygen, nitrogen, phosphorus, total dissolved solids, pH, coliforms, chlorophyl-a, biomass information, eutrophication evidence, temperature, suspended solids, turbidity, and sediment. Other parameters related to domestic wastewater may be needed in specific cases.

The hydrologic description of the receiving waters generally requires stream flow data, velocity data, location of tributaries and point source discharges, nonpoint source contribution rates, water withdrawal rates and other alteration of natural stream flow. Stormwater discharges are also of importance to many models as are meteorological data and stream channel geometry.

Modeling the impact of nonpoint source pollution requires additional input concerning land use, topography, and soil types.

The particular emphasis and specifics of each method and site determine the level of detail as well as the specific categories of data required for an analysis. Current thinking is that two intensive surveys of a one to two weeks duration be conducted to support such studies. One survey supports model calibration and the other supports model verification. A rule-of-thumb for effort expended in field activities is that they should be budgeted to the same or higher levels as the modeling analyses.

Documentation for Evaluation

An EPA WLA review is thorough and detailed. The information needs for the review cover the water quality management field: Water uses, water classifications, benefits of cleaner water, standards, data, modeling and WLA. A list of twelve information areas is presented here to specify the detailed documentation necessary to thoroughly justify a WLA:

1. Definition of receiving water, its uses and possible health issues (maps with demographic features) and the general hydraulic/physical setting (velocity of waters, gradient, lake or estuary, dimensions of impact or recovery zone, nature of bottom such as sandy or rocky and similar details).

2. Specification of impact zone, existing water quality (show data and evidence of problems) and of future water quality with proposed facility (for examples give modeling results) and of existing aquatic growth problems if nutrients influence level of treatment.

3. Justification and defense of design condition (low flow, water temperature).

4. Presentation of numerical standards, their relation to uses and stream classifications and their consistency with Red Book criteria.

5. Statement that existing water quality meets adopted WQS, or where disparities exists, indicate whether downgradings or upgradings are warranted. (Since most classified streams are designated for fishable/swimmable uses, proposed downgradings will probably predominate.) Downgradings must be justified on one of the three grounds described on p. 3, as specified in the WQS regulation 40 CFR 35.1550.

6. Specifications of previous field surveys and data used to support the analysis (quality versus time and quality versus distance graphs are very useful as well as details of measurements of waste inputs, instream quality and hydraulic variables) including, if possible, biological surveys and findings.

7. Tables of annual nutrient loads by category, PS, NPS, background and by limiting factor (if nutrient problem impairs water use).

8. Details of determination of an allowable nutrient loading with linkages to nutrient removal requirements (permissible area loading to lakes and National Eutrophication Survey procedures are typical level of detail).

9. Technically sound and detailed analysis of NPS and their relationship to treatment requirements (pull together Basin Plan, 208 and any EIS studies and tie it into presentation).

10. Presentation, specification, and discussion of methods (models or otherwise used to analyze field data, calibration and verification) and give the projections and waste load allocations.

11. Tabulation of calibrated model parameters (carbonaceous decay, nitrogenous decay, aeration, benthic uptake, temperature correction factors, logarithmic base (10 or e), and related parameters with justifications of their selection).

12. Tabulation of existing and proposed effluent flow and strength; include nearby PS and NPS data to show relative importance of proposed project.

Checklist of Problem Area

This list identifies typical "flaws" observed in materials presented in support of WLA justifications:

1. Hard data are not presented. Observed data from instream sampling and effluent sampling both in graphical and tabular form are desirable to enhance WLA justifications. The data should be matched by descriptions of how samples were obtained; e.g., grab samples, composite samples, diurnal effects, etc. In addition, the standards should be stated numerically. NPDES permits, existing and proposed, should be included.

2. Modeling results presented have not shown demonstrated calibration and/or verification. Also needed is the rationale for rates used and for model inputs, particularly where these differ from field measurements or particulars presented elsewhere in supporting documents. The modeled results should demonstrate consistency with other project justification presented.

3. Benefits of stream clean-up as the result of project implementation have not been well presented. Typically absent from materials presented have been details of instream water quality standards violations or public health problems that the project, as implemented, would alleviate. Administrator approval of projects is ultimately based upon such justification.

4. Maps are not detailed enough or are absent. "A picture is worth a thousand words" is a dictum relevant to WLA justifications.

5. Regional Context and the role of NPS and BMP's have been downplayed. The project as implemented should result in significant improvements to water quality and/or the public health. Beneficial results of the project should not be negated by NPS problems that are not addressed.

6. Blanket effluent discharge limitations often appear unjustified. They often do not show thoughtful application to the specific situation.

7. Design treatment flows, population and flow projections often seem overstated.

8. Critical design conditions are too stringent based on expected probabilities. In particular, it may not be reasonable to use the highest one-day temparature of record for any time of year, with a criterion such as 7Q10 low flow. Temperatures used in steady-state low-flow analyses should be weekly averages that would occur during the same calendar period as the low-flow event.

In addition to these "short run" flaws that will disappear as this methodology is standardized, there is the major question of model selection. This issue is expected to dominate the efforts to enhance and refine this guidance.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

12 JUL 1979

OFFICE OF WATER AND
HAZARDOUS MATERIALS

Construction Grants
Program Requirements Memorandum
PRM No. 79-10

SUBJECT: Qualification of Major Items of Equipment

FROM: John T. Rhett, Deputy Assistant Administrator
for Water Program Operations (WH-546) John T. Rhett

TO: Regional Administrator
Regions I-X

Purpose

This memorandum sets forth guidance for the qualification of major items of equipment for construction grant projects. This guidance is appropriate for use during either Step 2 or Step 3 phases of construction.

Discussion

The following qualification procedures are for optional use by Environmental Protection Agency (EPA) grantees who desire to qualify major items of equipment for construction grant projects with the approval of the EPA regional offices. Under 40 CFR 35.935-2,(43 FR 44071, September 27, 1978) the Regional Administrator may review grantee procurements including equipment qualification and may request additional grantee actions consistent with applicable statutes and regulations.

Qualification is a system that may be used to ease the administrative burden of determining responsive, responsible bidders on equipment. However, qualification is not a conclusive determination of responsibility and a qualified equipment bidder or offeror may be rejected as nonresponsive on the basis of subsequently introduced information e.g., shop drawings. In all cases the equipment furnished must comply with the specifications.

There are a number of necessary minimum requirements for any qualification system. Whether the qualification procedure is to take place in Step 2 or Step 3, all of these requirements must be met. If the qualification is to occur during Step 2 the qualification information package will not contain plans and specifications. Therefore a qualification information package containing the relevant information must be prepared. This package must contain enough specific detail regarding performance and quality to assure that equipment sources will thoroughly understand what is required of the specified equipment.

Adequate advertisement is critically important to assure that knowledge of the project is widespread and so that new manufacturers, small firms and minority businesses are provided an opportunity to compete. Adequate time must be allowed for submission of the necessary information for qualification review since an overly strict time frame would limit competition. This should conform to 40 CFR 35.938-4(b),(43 FR 44080, September 27, 1978), generally 30 days. Adequate time must also be provided for the engineering evaluation of the qualification packages submitted.

Policy

A. Advertisement

The grantee is responsible for accomplishing adequate advertisement for qualification. Whether qualification occurs during Step 2, or during Step 3, the advertisement procedure shall conform to Section 35.938-4(a) of the EPA regulations. The advertisement procedure for qualification shall also conform to the local regulations regarding advertisements for construction bids. In addition to advertisements, private mailings to known equipment sources may be made. Mailing lists of equipment sources are available from trade journals and technical associations. The advertisement shall contain all information needed by the sources to properly submit information regarding their equipment for consideration. The advertisement shall include the following as a minimum:

1. Address and telephone number of grantee.

2. Name, size and type of plant.

3. Name, address, and telephone number of the designer and name of contact for inquiries.

4. Location where qualification information package can be obtained.

5. Cost of qualification information package -- (this should not exceed the price that bidders must pay to obtain bidding documents).

6. Brief schedule of equipment needed in the construction project that is to be qualified (e.g., filter press).

7. Locations of qualification information for review by interested individuals. These locations should be the same as those used for additional information for contractors interested in bidding.

8. Deadline for submittal of qualification packages by equipment sources. This should be a minimum of 30 days from date of advertisement to allow adequate time for equipment sources to prepare their qualification package. Longer time periods should be provided for qualification submission for complex systems.

B. Qualification Information Package

The qualification information package, prepared by the design engineer, shall include the construction bid package plans and specifications or suitable extracts of this information if qualification occurs during Step 2. These specifications shall be performance specifications where possible and in all other cases conform to the two brand names or equal requirement. In addition to the plans and specifications, a description of the package the equipment sources submit for qualification consideration should be included.

The equipment sources should submit catalog cuts or readily available specifications and drawings of their equipment and any supplementary information that would be helpful in the evaluation. It should be stressed that shop drawing quality submittals are not required or wanted in this phase of the project.

All equipment manufacturers or distributors interested in supplying their equipment for the project must submit a qualification package for approval, including the suppliers who propose to furnish the equipment which may have been preliminarily named to indicate the salient requirements of the equipment desired. This is required so that all equipment offerors have the same opportunity to submit information for consideration, and to assure that the equipment offered fully meets all requirements of the specifications.

A time schedule of the qualification and bidding process must be included in the qualification information package.

C. Evaluation

Evaluation of the qualification submission shall be completed by the design engineer within 30 days from date of closing of submittals of qualification packages. At the end of the review period, the grantee will notify all proposers of their status (by registered mail return

receipt requested). Such correspondence should contain notice consistent with EPA protest regulations described below that any protest actions must take place within the time limitations described in 40 CFR 35.939(b), (43 FR 44083, September 27, 1978). By addendum to the specifications, the grantee will notify the holders of the bid package of the equipment that has been qualified for the specific project.

D. Protest Procedures

Protest procedures regarding qualification must conform to EPA regulations 40 CFR Section 35.939, (43 FR 44083, September 27, 1978).

The proposer of any equipment qualified as a result of a protest will be notified by the grantee and a further addendum to the specifications will be sent to the bid package holders.

In those cases when qualification takes place during Step 3 the entire process (including protests to the grantee, if any) should take place within the time frame of the advertisement for construction bids and the bid opening. When qualification takes place during the Step 2 adequate time must be allowed for submittals and prompt determination of qualified equipment must be made. All protests should be resolved before the bidding process. In order to satisfy this requirement, grantees must state in the qualification information package and notification to proposers of their status that any decision on qualification is final grantee action and the time for protests under 40 CFR 35.939(b), (43 FR 44083, September 27, 1978), begins to run from the date the proposers receive notification of their status from the grantee. Failure to protest within one week of this time period will result in finding the protest untimely. Consistent with the procedures of this memorandum, after determination of the qualified equipment no other equipment can be considered.

Qualification does not exempt the supplier from meeting the specifications. The specifications are the final authority for acceptance of equipment. Approval of a qualification package does not eliminate the need for shop drawing submittals and approvals during construction.

E. Construction Delays

If bidding is significantly delayed, then the qualification process may be reopened by the grantee with the EPA regional office approval in order to allow consideration of equipment sources that may then be interested in supplying equipment. In such cases the previously qualified equipment need not be reconsidered.

F. Other Qualification Procedures

Qualification procedures consistent with state or local law which provide the same considerations in terms of competition may be used in lieu of these procedures.

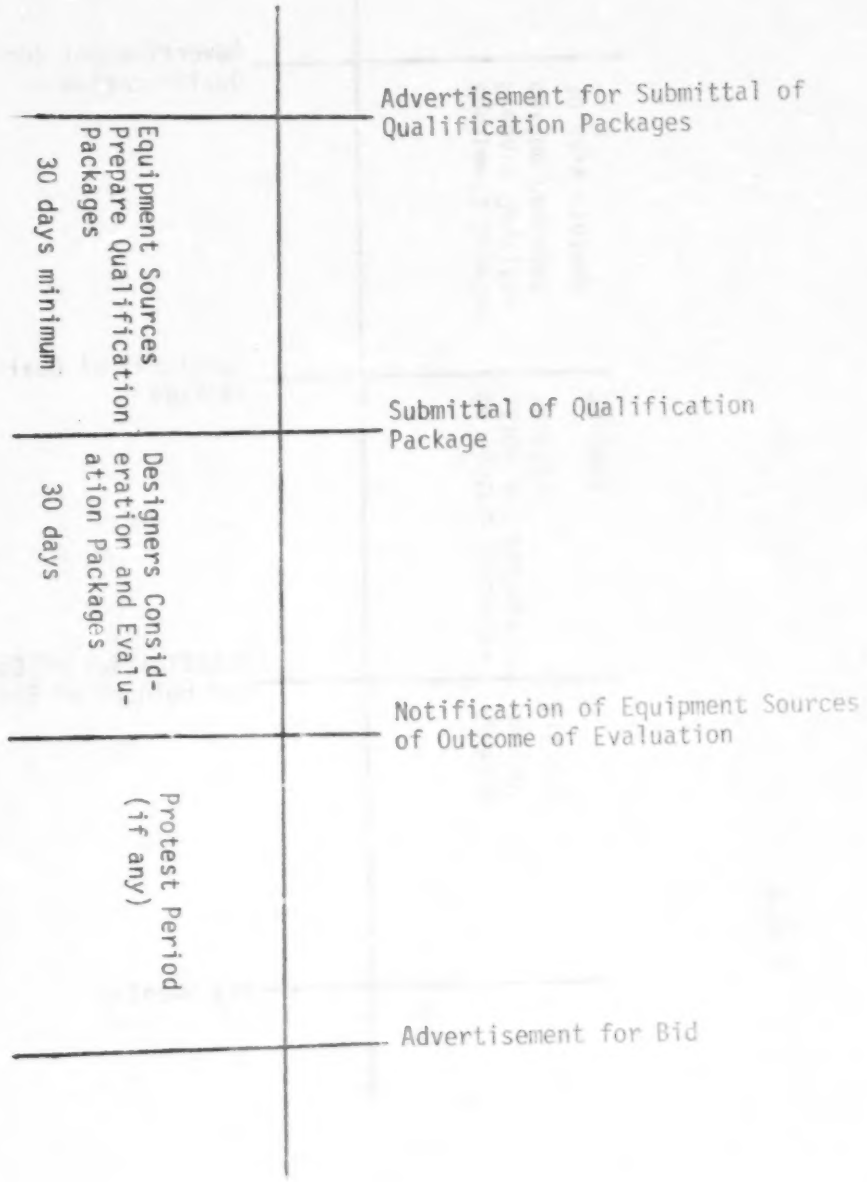
G. Public Inspection

On the cut off date for submittal of qualification packages for evaluation a list of all equipment sources that have submitted qualification packages shall be published. Whether the packages themselves become available for public inspection will be decided by local ordinances on the subject of public disclosure.

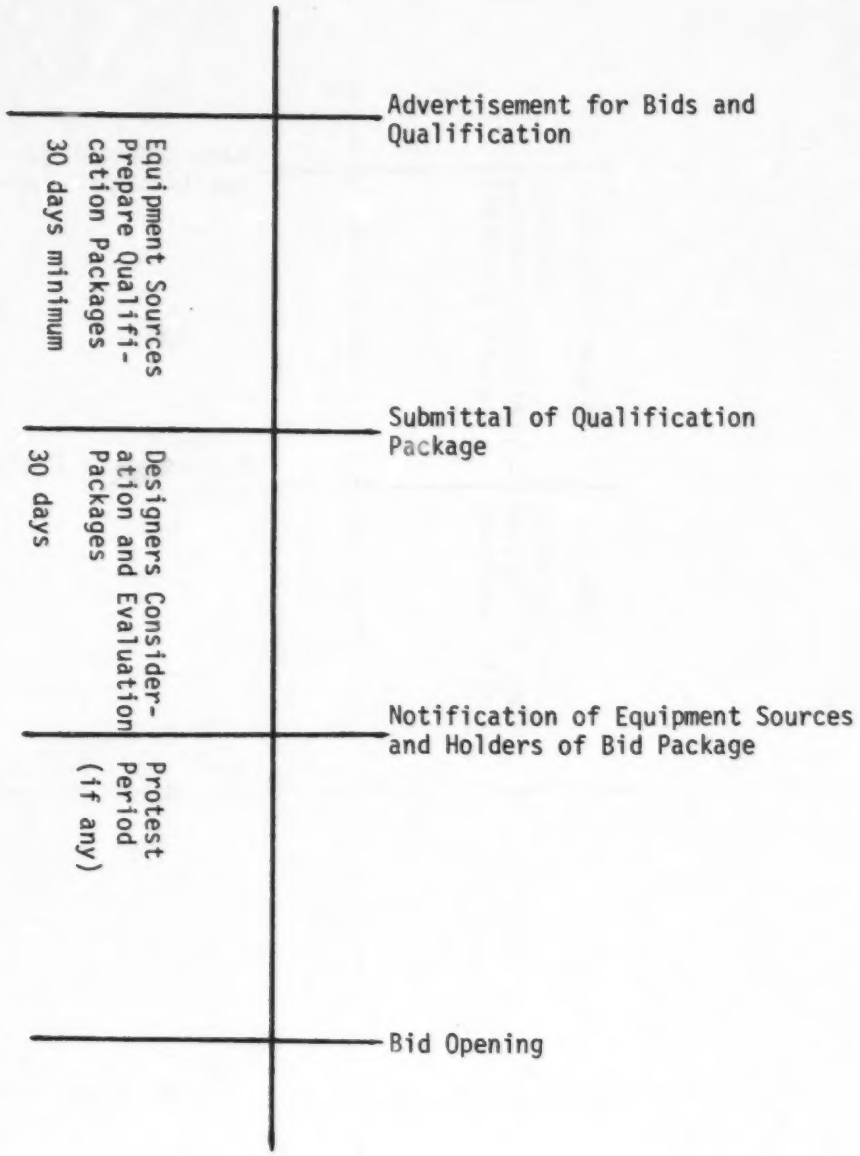
H. Costs

The cost incurred by the grantee incidental to qualification of major items of equipment for inclusion in a construction grant project are eligible for construction grant funding during the step in which they are undertaken.

Attachments


Advertisement for Submittal of Qualification Packages
Equipment Sources Prepare Qualification Packages
30 days minimum
Submittal of Qualification Package
Designers Consideration and Evaluation Packages
30 days
Notification of Equipment Sources of Outcome of Evaluation
Protest Period (if any)
Advertisement for Bid
STEP 2

Attachment 1



STEP 3

Attachment 2